REMARKS

Reconsideration of this Application is respectfully requested. In response to the Office Action mailed August 23, 2005, Applicant has amended claims 1-7 and 9-12, and added claim 13. Claims 1-13 are pending.

Based on the above Amendment and the following Remarks, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding objections and rejections.

Objection to the Specification

On page 2, the Action objects to the number of words used in the Abstract.

Accordingly, the Abstract has been shorted to less than 150 words, as suggested by the Action. Applicant respectfully requests that the objection be withdrawn.

Objection to the Claims

On page 2, the Action objects to claim 3 because of informalities.

Accordingly, claim 3 has been amended to recite "wherein the optical measuring device is provided with a first light source and a second light source, wherein the first light source emits light in the X-direction and the second light source emits light in the Y-direction onto the cable." Applicant submits that this amendment overcomes the objection and respectfully requests that the objection be withdrawn.

Rejections under 35 U.S.C. § 112

On pages 3-4, the Action rejects claims 1-12 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

(A) The Action rejects claim 1 alleging the phrase "and determine the field intensity" is not clear. The Action states that it is "not clear which element performs the claimed function."

Claim 1 has been amended to recite "wherein measuring coils of the inductive measuring coil arrangement are arranged in pairs or cut in half with respect to the optical measuring plane, **said measuring coils determining** a field intensity in front of the optical measuring plane and a field intensity behind the optical measuring plane." Applicant submits that this overcomes the claim rejection. Applicant respectfully requests that the rejection be withdrawn.

(B) The Action rejects claim 1 alleging that the phrase "an active inductive measuring plane . . . plane M" is unclear. The Action presents the question whether the "active inductive measuring plane" is the same as the "active measuring plane M."

Applicant submits that the "active inductive measuring plane" coincides with the "optical measuring plane" to form the "active measuring plane M." Relevant to this question presented in the Action are three types of planes recited in amended claim 1. Specifically, amended claim 1 recites (1) "determining an external diameter and a position of a cable in **an optical measuring plane**," (2) "correlating the field intensities in front of and behind the optical measuring plane to determine a field intensity in **an active inductive measuring plane**," and (3) "said active inductive measuring plane coinciding with the optical measuring plane to form **a joint, active measuring plane M**." Thus, the joint, active measuring plane is formed where the optical measuring plane coincides with the active inductive measuring plane. Therefore, Applicant submits that this answers the question presented in the Action and respectfully requests that the rejection be withdrawn.

(C) The Action alleges that lines 15-22 of claim 1 are unclear. The Action states that the "correlated process is not clear" since it "is not clear how or which of the measured intensities are correlated."

Claim 1 has been amended to recite "said measuring coils determining a field intensity **in front of** the optical measuring plane and a field intensity **behind** the optical measuring plane, said inductive measuring coil arrangement correlating the field intensities in front of and behind the optical measuring plane to determine a field intensity in an active inductive measuring

plane."

To answer the "which of the measured intensities are correlated" question, Applicant notes that claim 1 recites measuring two types of field intensities. The first field intensity is measured in front of the optical measuring plane, and the second field intensity is measured behind the optical measuring plane. Thus, the field intensities in front of and behind the optical measuring plane are the field intensities that are correlated.

To answer the "how . . . the measured intensities are correlated" question, Applicant refers to an exemplary embodiment in the present invention described in, for example, paragraphs [0077]-[0078] and in, for example, FIG. 4 of this application describing correlating field intensities. This section teaches that windings 21 of measuring coils $+X^1$, $+X^2$, $-X^1$, $-X^2$ are located approximately in an X-plane. For the measuring coil pair +X, the voltage is determined as the sum of the partial voltages induced in the individual coils $+X^1$ and $+X^2$. The same is true for the measuring coil pair -X. The difference between these two voltages is then determined. Since the measuring coil pairs +X and -X are arranged symmetrical to the measuring plane M and the above-described difference is determined, the measuring plane M must be viewed as active measuring plane for the inductive measuring coil arrangement, which also represents the measuring plane for the optical measuring device. Thus, this section describes an exemplary embodiment of how field intensities determined at measuring coils in front of and behind an optical measuring plane may be correlated. Therefore, Applicant submits that the claimed correlation is clear and respectfully requests that the rejection be withdrawn.

(D) The Action rejects claim 3 stating that "the phrase 'respectively one light sensor which detects the light emitting by the opposite-arranged light source' is not clear. Is there more than one detector? What is the opposite-arranged light source?"

Applicant has amended claim 3 to recite: "wherein the optical measuring device is provided with a first light source and a second light source, wherein the first light source emits light in the X-direction and the second light source emits light in the Y-direction onto the cable,

and the optical measuring device is respectively provided with a first sensor on the opposite side of the cable in the X-direction from said first light source, and a second sensor on the opposite side of the cable in the Y-direction from said second light source, said first sensor and said second sensor being adapted to respectively detect light emitted by the first and second light sources."

Applicant submits that this amendment overcomes the rejection and respectfully requests that the rejection be withdrawn.

(E) The Action rejects claim 5 stating that the phrase "'positioned perpendicular to the measuring plane M' is not clear," and the Action presents questions (1) "Does applicant mean the 'effective surface' or the 'X-plane' and 'Y-plane'?" and (2) "What is the 'measuring plane M'? Does applicant mean the 'the active measuring plane M'?"

For question (1), claim 5 has been amended to recite: "the X-plane and the Y-plane being positioned perpendicular to the joint, active measuring plane M." Applicant submits that this overcomes the rejection.

Referring to question (2) above, the phrase "measuring plane M" has antecedent basis in claim 1. Accordingly, claim 5 has been amended to reflect the previously recited "joint, active measuring plane M" of claim 1. Applicant respectfully requests that the rejection of claim 5 be withdrawn.

(F) On page 4, the Action rejects claim 6 alleging the paragraph "a separate measuring coil . . . central axis Z" is not clear. The Action questions (1) whether the "measuring coil pair" is the same as the "four coil pairs?," and (2) what is the "measuring plane M?"

For question (1), Applicant notes that claim 6 does not recite "four coil pairs," as stated in the Action. Claim 6 recites four *measuring* coil pairs. Nevertheless, claim 6 has been amended to recite "a first measuring coil of one of the four measuring coil pairs being positioned in front of the joint, active measuring plane M and a second measuring coil of this measuring coil pair being arranged behind the joint, active measuring plane M, the first and second measuring coils

being arranged symmetrical to the joint, active measuring plane M and to the central axis Z." Applicant submits that this overcomes the rejection and respectfully requests that it be withdrawn.

Referring to question (2) above, the phrase "measuring plane M" has antecedent basis in claim 1. Accordingly, claim 6 has been amended to reflect the previously recited "joint, active measuring plane M" of claim 1. Applicant respectfully requests that the rejection of claim 6 be withdrawn.

(G) The Action rejects claims 7 and 9 questioning whether the "measuring coil arrangement" is the same as the "inductive measuring coil arrangement" in claim 1.

Claims 7 and 9 have been amended to recite "inductive measuring coil arrangement," as recited in claim 1. Applicant respectfully requests that the rejection be withdrawn.

(H) The Action rejects claim 9 questioning if the "measuring plane M" is the "the active measuring plane M."

Accordingly, claim 9 has been amended to reflect the previously recited "joint, active measuring plane M" of claim 1. Applicant respectfully requests that the rejection of claim 9 be withdrawn.

(I) The Action rejects claim 10 stating the optical measurement is not clear. The Action then asks "Are they the same?"

Claim 10 has been amended to recite a first optical measurement and a second optical measurement. Specifically, claim 10 recites: "wherein a first optical measurement takes place in a direction X, which is perpendicular to the central axis Z, and a second optical measurement takes place in a direction Y that is also perpendicular to the central axis Z, the X- and Y-directions enclose an angle, in particular a 90° angle, and wherein the X-direction for the first optical measurement is located in the X-plane for the inductive measurement and the Y-direction for the second optical measurement is located in the Y-plane for the inductive measurement." Applicant submits that this overcomes the rejection and respectfully requests that it be

withdrawn.

(J) The Action rejects claim 11 stating the paragraph "wherein the field intensities . . . measuring plane M" is not clear. The Action also refers to the 35 U.S.C. 112, second paragraph rejection of claim 1 above.

For reasons analogous to those given above for amended claim 1, Applicant submits that amended claim 11 is clear and respectfully requests that the rejection be withdrawn.

Rejections under 35 U.S.C. § 103

On pages 4-6, the Action rejects claims 1-12 under 35 U.S.C. § 103(a) as being unpatentable over E.P. Patent Application No. 0 692 697 A3 to Kyriakis (hereinafter "Kyriakis") in view of U.S. Patent No. 5,214,376 to Sikora (hereinafter "Sikora"), in further view of U.S. Patent No. 6,661,502 to Jakobsen et al. (hereinafter "Jakobsen"). Applicant respectfully disagrees.

(A) On page 4, the Action rejects claim 1. Claim 1 recites: "A contactless system for measuring centricity and diameter, said system comprising: i) an optical measuring device for determining an external diameter and a position of a cable in an optical measuring plane, the optical measuring plane being perpendicular to and transverse to a central axis Z of a measuring device, wherein the cable comprises a conductor with insulating jacket and is pulled in the direction of the central axis Z through the measuring device; ii) an inductive measuring coil arrangement for determining the position of the conductor in an inductive measuring plane, the inductive measuring plane being perpendicular to and transverse to the central axis Z of the measuring device; and iii) **means for computing the centricity** of the conductor inside the jacket based on the **position of the cable**, determined with the optical measuring device, and the **position of the conductor**, determined with the inductive measuring coil arrangement, wherein measuring coils of the inductive measuring coil arrangement are arranged in pairs or cut in half with respect to the optical measuring plane, said measuring coils determining **a field intensity in**

front of the optical measuring plane and **a field intensity behind the optical measuring plane**, and said inductive measuring coil arrangement **correlating** the field intensities in front of and behind the optical measuring plane to determine a field intensity in an active inductive measuring plane, said active inductive measuring plane coinciding with the optical measuring plane to form a joint, active measuring plane M." (Emphasis added.)

Applicant respectfully traverses the rejection as the Action fails to establish a *prima facie* case of obviousness to reject claim 1. In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See M.P.E.P. § 2143.

For at least the following two reasons, the Action does not establish a *prima facie* case of obviousness to reject claim 1 based on the combined teachings of Kyriakis, Sikora, and Jakobsen.

First, Kyriakis, Sikora, and Jakobsen do not teach or suggest determining and correlating field intensities in front of and behind an optical measuring plane. Specifically, Kyriakis, Sikora, and Jakobsen do not teach or suggest "wherein measuring coils of the inductive measuring coil arrangement are arranged in pairs or cut in half with respect to the optical measuring plane, said measuring coils determining **a field intensity in front of the optical measuring plane** and **a field intensity behind the optical measuring plane**, said inductive measuring coil arrangement **correlating** the field intensities in front of and behind the optical measuring plane to determine a field intensity in an active inductive measuring plane," as recited in claim 1. On pages 4-5, the Action does not indicate where any of Kyriakis, Sikora, or Jakobsen teach this feature. In fact, none of these references teach or suggest any such feature.

In FIGs. 1 and 2, Kyriakis teaches a measuring system that incorporates a pair of induction coils 8 and 9 disposed on either side of cable 3 on an X-axis (see Kriakis, FIG. 2),

which is the same axis as that of the parallel scanning beam emitted by light source 2 and received by the photosensitive detector 5 (see Kyriakis, FIGs. 1 and 2, col 3, lines. 38-42). Thus, Kriakis teaches induction coils 8, 9 measuring the magnetic fields in the **same plane** as the light source 2 and the photosensitive detector 5. However, Kryiakis does not teach or suggest the induction coils 8, 9 determining a field intensity **in front of and behind** an optical measuring plane formed by the light source 2 and the photosensitive detector 5. Kryiakis also does not teach or suggest a device **correlating** field intensities **in front of and behind** an optical measuring plane formed by the light source 2 and the photosensitive detector 5.

In FIG. 1, Jakobsen teaches measuring the diameter and/or eccentricity of the one or more coating layers of a coated optical fiber using a light source 7 (see Jakobsen, Abstract, FIG. 1). However, Jakobsen does not teach or suggest measuring coils of an inductive measuring coil arrangement determining a field intensity in front of or behind an optical measuring plane formed by the light source 7 and the optical detector 9. Jakobsen also does not teach a device **correlating** field intensities **in front of and behind** an optical measuring plane formed by the light source 7 and the optical detector 9.

In FIG. 1, Sikora teaches sensor 42 having induction coils for inducing a voltage from a high frequency current to a conductor 10 (see Sikora, FIG. 1, col. 5, lines 36-49). However, Sikora does not teach or suggest the sensor 42 determining a field intensity in front of and behind an optical measuring plane. Sikora also does not teach a device **correlating** field intensities **in front of and behind** an optical measuring plane.

Hence, Kyriakis, Sikora, and Jakobsen do not teach or suggest determining and correlating field intensities in front of and behind an optical measuring plane. Thus, Kyriakis, Sikora, and Jakobsen do not teach or suggest "wherein measuring coils of the inductive measuring coil arrangement are arranged in pairs or cut in half with respect to the optical measuring plane, said measuring coils determining **a field intensity in front of the optical measuring plane** and **a field intensity behind the optical measuring plane**, said inductive

measuring coil arrangement **correlating** the field intensities in front of and behind the optical measuring plane to determine a field intensity in an active inductive measuring plane," as recited in claim 1.

Second, Kyriakis, Sikora, and Jakobsen do not teach or suggest correlating a position of a cable determined from an optical measuring device and a position of a conductor determined from an inductive measuring coil arrangement. Specifically, Kyriakis, Sikora, and Jakobsen do not teach or suggest "**means for computing the centricity** of the conductor inside the jacket based on the **position of the cable**, determined with the optical measuring device, and the **position of the conductor**, determined with the inductive measuring coil arrangement," as recited in amended claim 1. On page 5, the Action admits that Kyriakis does not teach a "means for correlating the position of cable with the position of the conductor as claimed." The Action relies on column 6, lines 15-20 of Jakobsen for a teaching of this feature.

However, this section of Jakobsen does not teach or suggest "**means for computing the centricity** of the conductor inside the jacket based on the **position of the cable**, determined with the optical measuring device, and the **position of the conductor**, determined with the inductive measuring coil arrangement," as recited in amended claim 1. At the section cited in the Action, Jakobsen states that a "signal processor 10 must take this correlation into account in calculating the diameter and/or eccentricity of the primary coating layer." The correlation referred to in the cited passage is further described in column 6, lines 5-14 of Jakobsen, which teaches that a

> "***correlation*** exists between ***pixel locations in the image data*** and ***actual locations in the cross-section of the coated optical fiber***. This correlation depends on, for example, the magnification of the lens 8, the relative locations of the lens 8, the array 9 and the coated optical fiber 14, etc. Also, the magnification of the lens 8 will determine the length of the linear photosensor array 9. The correlation also depends on the lens effect that the coated optical fiber has on light passing through it." (Emphasis added.)

Applicant submits that a correlation between pixel locations in image data and actual locations in a cross-section of coated fiber is not analogous to the claimed means for computing

centricity. Nowhere does Jakobsen disclose ***computing a centricity*** of a conductor within a jacket based on a ***position of a cable*** determined by an ***optical*** measuring device with a ***position of a conductor*** determined with an ***inductive*** measuring coil arrangement. Kriakis is not relied on for a teaching of this claim feature, and, in fact, does not teach or suggest any such correlation. Thus, Kyriakis, Sikora, and Jakobsen do not teach or suggest "means which correlate the **position of the cable**, **determined** with **the optical measuring device**, and the **position of the conductor**, **determined** with the **inductive measuring coil arrangement**, to compute the centricity of the conductor inside the jacket," as recited in claim 1.

Therefore, claim 1 is allowable since the references by the Action, alone or in combination, do not teach or suggest all of the claim features and hence the Action does not establish a *prima facie* case of obviousness to reject claim 1. Claims 2-10, which depend from claim 1, are also in condition for allowance due to their dependence on an allowable claim.

(B) On pages 4-5, the Action rejects claim 11.

Claim 11 is allowable for reasons analogous to those given in support of claim 1. Claim 12, which depends from claim 11, is also in condition for allowance due to its dependence on an allowable claim.

New Claim

Independent claim 13 has been added to the Application.

Independent claim 13 recites: "A contactless system for measuring centricity and diameter of a cable including a conductor within an insulating jacket, the cable being received along a central axis, said system comprising: an optical measuring device adapted to determine a position of the cable in a measuring plane, the measuring plane being perpendicular and transverse to the central axis; an inductive measuring coil arrangement adapted to determine a position of the conductor in the measuring plane, said inductive measuring coil arrangement having a plurality of measuring coils arranged in pairs or cut in half with respect to the measuring

plane, said inductive measuring coil arrangement being adapted to determine the position of the conductor based on a first field intensity in front of the measuring plane and a second field intensity behind the measuring plane; and a device adapted to compute a centricity of the conductor within the jacket based on the position of the cable and the position of the conductor."

Claim 13 is allowable for reasons analogous to those given in support of claim 1.

Accordingly, claims 1-13 are in condition for allowance and allowance thereof is respectfully requested.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is hereby invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

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